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ABSTRACT

Using subjects classified on the basis of positive and less positive self-concepts, this study investigates the effects of instructions, a principle, and practice with four concept-attainment problems on the efficiency of the attainment of concepts among subjects. The findings indicate the subjects with more positive self-concepts attain abstract concepts significantly more efficiently than lower self-concept subjects. This study also replicates the findings of prior studies by supporting the effectiveness of manipulating instructions to facilitate concept learning. These findings and their implications are discussed. (SJL)

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CONCEPTUAL LEARNING AND THE SELF-CONCEPT[1]

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While the investigation of personality variables and their relationship to conceptual learning may be an interesting problem, the research efforts may not be very productive in terms of the discovery of significant effects on relationships. For example, Tutko and Sechrest (1962) found only four significant correlations between four conceptual variables and the 15 needs of the EPPS. Of the 60 correlations the four significant ones were the relationship of conceptual learning to nurturance, affiliation, intraception, and endurance. There were no significant correlations found by Meinke and Klausmeier (1967) when total test scores of personality measures were correlated with time to criterion as the measure of concept attainment. There was, however, a significant correlation of the part score, Lack of Development of Integrated Self, on the IPAT Anxiety Scale for males on the first concept problem. If this variable were an important factor, it would seem reasonable that a more complete measure of the self-concept could be manipulated in an experimental design in order to determine its effects relative to concept attainment. In a study by Foulkes and Heaxt (1962) a significant effect for the variable of self attribution was found only for the "warm" group on the abstract concept task and not on the predicted thematic concept problem. In the present study Ss will be classified along a continuum of high positive self-concepts to lower or less positive self-concepts rather than the categories of "intelligent", "good looking", "dominant", and "warm" which were used by Foulkes and Heaxt (1962).

Other variables to be manipulated in the study were instructions, a principle, and practice of Ss with four concept attainment problems. Klausmeier

and Meinke (1968) have found significant effects for these variables when employing several dependent variables. The purpose of this study was, then, to investigate the effects of instructions, a principle, and practice upon the efficiency of the attainment of concepts among Ss who were classified on the basis of positive and less positive self-concepts.

METHOD

SUBJECTS

Thirty six subjects were used in the study. They were college students enrolled in a sophmore level educational psychology class. Half of the Ss were classified as persons with high positive self-concepts and half were classified as low positive self-concepts according to measures taken using a Q-sort technique.

EXPERIMENTAL TASK

All Ss attempted four concept attainment problems. The concept problems were imbedded in a 64 card board which had six dichotomous dimensions. The dimensions and values were number of borders, one or two; border continuity, continuous or broken; color, red or green; size, large or small; shape, circles or elipses; and number, one or two. All of the concept problems were three attribute problems which were selected at random from all possible three attribute problems.

SELF-CONCEPT MEASURE

The procedure for measuring the self-concept was a modification of the Q-sort technique for the measurement of the self-concept constructed by Engel (1959). There were fifty positive and fifty negative statements which

were assigned positive or negative valences by S. The statements were then sorted into boxes along a continuum from "most like me" to "least like me". The frequencies of statements assigned to each of eleven categories were 4, 7, 9, 11, 12, 14, 12, 11, 9, 7, and 4. Positive statements placed in each of the categories were scored points which ranged from 11 to 1 point. The positive statements in category one were scored eleven points each, those in the next category each received ten points, and so forth until one point was given for any in the last category. Scores of three hundred or higher were considered to be reflective of positive self-concepts.

EXPERIMENTAL PROCEDURE

Ss were scheduled individually and were run by an experimenter in a small conference room. The instructions were read to S by E according to the appropriate treatment condition. When Ss had no further questions, E presented the first concept problem by showing S the focus card. S selected cards until he offered the correct hypothesis which specified the correct concept or until twelve minutes had elapsed. If S failed to attain the concept, E told S the correct concept and then presented the second concept problem. The specific instructions, minimal, structure, and strategy, and the principle have been reported by Klausmeier and Meinke (1968) in an earlier paper.

EXPERIMENTAL DESIGN

The design for this study was a 2x2x3x4 factorial design with repeated measures on the last factor. The first factor was high or low positive self-concept; the second factor was principle or no principle; the third factor was instructions, minimal, structure, or strategy; and the last factor was

the repeated measure, ordinal position of the four concept problems attempted by each S. There were three replications per cell with the repeated measure to determine the effect of practice. The four dependent variables were time to criterion, number of stimulus cards selected, number of hypotheses offered, and the amount of potential information available to the S. Therefore, four separate analyses were completed.

RESULTS

In Table I are shown the results of the analyses of variance for the four dependent variables. The effect for instructions was significant only when the number of hypotheses generated was used as the dependent variable ($F=4.06$, d.f.=2, $p<.05$). (See Table I.) The self-concept as a variable was significant when time to criterion and when the number of hypotheses were used as dependent variables ($F=4.45$, d.f.=1, $p<.05$; $F=5.41$, d.f.=1, $p<.05$). The effect of the principle was significant only when the number of cards was used as the dependent variable ($F=10.92$, d.f.=1, $p<.01$). The effect of ordinal position or practice was significant for three dependent variables, time to criterion ($F=29.10$, d.f.=3, $p<.01$), number of cards selected ($F=15.51$, d.f.=3, $p<.01$), and number of hypotheses ($F=2.94$, d.f.=3, $p<.05$).

While there were no significant interaction effects for the non-correlated main effects, there were significant interaction effects with the correlated main effect, ordinal position. There was a significant instructions by principle by ordinal position interaction effect when the dependent variable was time to criterion ($F=2.31$, d.f.=6, $p<.05$). There was a significant self-concept by principle, by ordinal position interaction effect for two dependent variables, number of cards to criterion ($F=3.79$, d.f.=3, $p<.05$) and the amount of potential information ($F=3.22$, d.f.=3, $p<.05$).

TABLE I

ANOVAS for Data Using Each of Four Dependent Variables

Source of Variation	df	Time to Criterion		Number of Cards		Number of Hypotheses		Amount of Information	
		Mean Squares	F	Mean Squares	F	Mean Squares	F	Mean Squares	F
Between Ss									
Instructions (I)	2	32,295.22	NS	21.58	NS	8.77	*	.77	NS
Self-Concept (SC)	1	249,500.20	*	138.06	NS	11.67	*	.11	NS
Principle (P)	1	24,232.11	NS	646.01	**	5.84	NS	1.00	NS
I x SC	2	60,186.06	NS	22.75	NS	6.17	NS	1.36	NS
I x P	2	182,699.60	NS	55.03	NS	2.80	NS	.58	NS
SC x P	1	25,493.45	NS	11.67	NS	6.67	NS	.28	NS
I x SC x P	2	40,361.66	NS	73.44	NS	.34	NS	.53	NS
Subj. w. Groups	24	56,077.04		59.14		2.16		.83	
Within Ss									
Ordinal Position (O)	3	546,942.30	**	439.71	**	7.34	*	.55	NS
O x I	6	10,773.16	NS	28.40	NS	1.83	NS	.99	NS
O x SC	3	27,643.33	NS	40.67	NS	.56	NS	.37	NS
O x P	3	6,574.33	NS	17.51	NS	.14	NS	.22	NS
O x I x SC	6	23,415.14	NS	43.36	NS	1.40	NS	.26	NS
O x I x P	6	43,389.28	*	30.47	NS	.76	NS	.33	NS
O x SC x P	3	25,276.16	NS	107.43	*	1.27	NS	1.73	*
O x I x SC x P	6	16,627.13	NS	24.42	NS	3.99	NS	.70	NS
O x Subj. W. Groups	72	18,793.63		28.35		2.49		.54	

*$p < .05$
**$p < .01$

DISCUSSION

The effect of instructions has previously been shown to be a significant variable in concept learning, Klausmeier and Meinke (1968), Meinke and Klausmeier (1969). The few number of replications per cell may account for the lack of the significant effects across all dependent variables for instructions. The earlier study used 17 replications while the present one used only three.

In spite of Tutko and Sechrest's (1962) statement that conceptual behavior and self-description of personality may have nothing in common under any circumstances, the present study has shown that more positive self-concept Ss attain abstract concepts significantly more efficiently than lower self-concept Ss and they also offer significantly fewer hypotheses to criterion than lower self-concept Ss. High positive self-concept Ss do not differ significantly from lower self-concept Ss on the number of stimulus cards selected prior to the attainment of the concept nor on the amount of potential information secured.

Ss who were given the principle selected significantly fewer cards prior to concept attainment than Ss who were not given the principle. This finding was previously demonstrated by Meinke and Klausmeier (1968) and again the fact of only three replications per cell may account for the lack of significant effects across all dependent variables.

The effect of ordinal position was significant for all dependent variables except the amount of potential information available. This is a precise replication of a previous finding of Meinke and Klausmeier (1969) and the interpretation remains the same. That is, Ss learn to solve concepts more efficiently with fewer cards selected and with fewer hypotheses offered as they gain practice from one concept problem to the next.

The significant third order interactions occurred only with the repeated measure factor, ordinal position. The one with the instructions and the principle and ordinal position was not found in prior studies. The other one was an interaction of the self-concept, principle, and ordinal position.

This study has replicated some of the findings of prior studies and has supported the effectiveness of manipulating instructions and a principle to facilitate concept learning. A teacher in a classroom situation can do both of these, but the effects should be tested under classroom situations employing concepts commonly learned by pupils in the schools.

The more important result of this study was the finding that Ss with more positive self-concepts attain abstract concepts more efficiently with fewer hypotheses than lower self-concept Ss. It may be that lower self-concept Ss engage in more guessing behavior which uses up time and thus are less efficient in the attainment of abstract concepts. The implication of these findings for the classroom teacher are twofold. First, it might be helpful to work with lower self-concept pupils in order to help them improve their hypothesizing behaviors and/or second, help them to develop more positive self-concepts.

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